

WHAT IS CLAIMED IS:

1. An ophthalmic lens comprising:
  - 5 a • a substrate made of organic glass, said substrate comprising front and rear main faces,
  - b • an optically transparent composite film deposited on the front main face of the substrate, said transparent composite film comprising:
    - 10 - a latex layer having an outer main face provided with parallel microgrooves, and
    - a polarizing dye material filling at least partially the said microgrooves.
2. The ophthalmic lens of claim 1, wherein the polarizing dye  
15 material fills at least 50% of the volume of the microgrooves.
3. The ophthalmic lens of claim 1, wherein the polarizing dye material totally fills the microgrooves.
4. The ophthalmic lens of claim 3, wherein the polarizing dye material forms a continuous layer over the microgrooves.
- 20 5. The ophthalmic lens of claim 1, wherein the polarizing dye material is made from a mixture comprising organic colorants and an alkaline wetting agent.
6. The ophthalmic lens of claim 1, wherein the organic colorants correspond to the three primary colours and exhibit a nematic state.
- 25 7. The ophthalmic lens of claim 1, wherein the depth of the microgrooves ranges from 50 to 300 nm.
8. The ophthalmic lens of claim 1, wherein the depth of the microgrooves is about 100 nm.
9. The ophthalmic lens of claim 1, wherein the width of the  
30 microgrooves ranges from 5nm to 5 micrometers.
10. The ophthalmic lens of claim 1, wherein the width of the microgrooves ranges from 5 nm to less than 1 micrometer.
11. The ophthalmic lens of claim 1, wherein the thickness of the latex layer ranges from 0.5 to 5  $\mu\text{m}$ .
- 35 12. The ophthalmic lens of claim 1, wherein the thickness of the latex layer ranges from 0.5 to 2  $\mu\text{m}$ .

13. The ophthalmic lens of claim 1, wherein the thickness of the latex is about 1  $\mu\text{m}$ .

14. The ophthalmic lens of claim 1, wherein the latex is selected from the group consisting from poly(meth)acrylic latex, polyurethane latex  
5 and polyester latex.

15. The ophthalmic lens according to claim 1, wherein the substrate is chosen from:

(I) the glasses obtained by polymerization of diethylene glycol bis(allyl carbonate);

10 (II) the glasses obtained by polymerization of acrylic monomers derived from bisphenol A;

(III) the glasses obtained by polymerization of allyl monomers derived from bisphenol A.

16. The ophthalmic lens according to claim 1, wherein the  
15 substrate is chosen from:

(A) the glasses obtained from poly(methyl methacrylate);

(B) the glasses obtained from polystyrene resin;

(C) the glasses made of resin based on diallyl phthalate.

17. The ophthalmic lens of claim 1, wherein the lens further  
20 comprises a hard abrasion resistant coating deposited on the optically transparent composite film.

18. The ophthalmic lens of claim 17, wherein the hard abrasion resistant coating is a polysiloxane coating.

19. The ophthalmic lens of claim 18, wherein the polysiloxane  
25 coating is obtained by curing a hydrolysate of silanes containing an epoxysilane.

20. The ophthalmic lens of claim 1, wherein the lens further comprises an anti-reflection coating deposited on the hard abrasion-resistant coating.

30 21. The ophthalmic lens of claim 1, wherein the lens further comprises a hydrophobic top coat deposited on the anti-reflection coating.

22. A process for the manufacture of an ophthalmic lens as defined according to claim 1, comprising the following steps:

- a • providing a substrate made of organic glass having front and rear and rear main faces,
- b • optionally carefully cleaning and drying the front face of the substrate, which is to receive an optically transparent composite film comprising a latex layer and a polarizing dye material,
- c • applying on the front face of the substrate a latex composition and drying or partially precuring said composition to form a dry latex layer having an outer face,
- d • preparing the face of the latex layer opposite to the substrate by forming parallel microgrooves on the said face of the latex layer,
- e • depositing a polarizing dye material on the front face of the said latex layer having the microgrooves, the said microgrooves being at least partially filled by the polarizing dye material,
- f • treating the resulting polarizing dye material for fixing the polarizing dye material.

23. The process of claim 22, wherein, in step f), the treatment of the polarizing dye is made in aqueous solution of inorganic salts in order to reduce the water solubility of said dye material.

24. The process of claim 22, wherein at least 50% of the volume of the microgrooves are filled by the polarizing dye material.

25. The process according to claim 22, wherein the parallel microgrooves are totally filled by the polarizing dye material.

26. The process according to claim 22, wherein the parallel microgrooves are covered by a continuous layer of the polarizing dye material.

27. The process according to claim 22, wherein the parallel microgrooves are formed on the outer face of the transparent composite film with the aid of a slightly abrasive rubbing of the said outer face.

28. The process according to claim 27, wherein the outer face of the transparent composite film is rubbed by using a soft cloth and abrasives.

29. The process according to claim 23 or 24, wherein the process further comprises, prior to applying the polarizing dye material, a cleaning

step of the outer face of the transparent composite film provided with the microgrooves.

30. The process according to claim 29, wherein the cleaning step comprises:

- 5       - rinsing with water the outer face of the transparent composite film, and then washing it with a soft cloth,
- rinsing again with deionized water the said outer face of the transparent composite film, and then drying it.

31. The process according to claim 22, wherein the parallel  
10 microgrooves are formed through a process comprising a step for transferring the microstructure corresponding to the microgrooves from a mould, an internal face of which supports the said microstructure.

32. The process according to claim 31, wherein the step for transferring the microstructure corresponding to the microgrooves is  
15 carried out by a transfer molding technique.

33. The process according to claim 32, wherein the transfer molding technique is a die-stamping technique.

34. The process according to claim 32, wherein the transfer molding technique is an overmolding technique.

20 35. The process according to claim 32, wherein the transfer molding technique is an in-mould technique.

36. The process according to claim 23, wherein the inorganic salts contained in the aqueous treatment solution may be selected in the group essentially consisting of dehydrated barium chloride, aluminium  
25 chloride, and barium chloride.

37. The process according to claim 22, wherein the process successively includes the steps:

- applying a hard abrasion-resistant coating on the transparent composite film, and,
- 30       - applying an anti-reflection coating on the a hard abrasion-resistant coating, and,
- applying an hydrophobic top coat on the anti-reflection coating.